

Electronic Supplementary Information (ESI)

Graphene oxide/conducting polymer composite hydrogels†

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1. Preparation of graphene oxide (GO)

Graphite oxide (GO) was synthesized from natural graphite powder by a modified Hummers method.¹⁻³ Graphite (3.0 g, 325 mesh) was added to concentrated sulfuric acid (70 mL) under stirring at room temperature, then sodium nitrate (1.5 g) was added, and the mixture was cooled to 0 °C. Under vigorous agitation, potassium permanganate (9.0 g) was added slowly while the temperature of the suspension was kept lower than 20 °C. Successively, the reaction system was transferred to a 35°C water bath and stirred for about 0.5 h, forming a thick paste. Then, 150 mL water was added, and the solution was stirred for 15 min at 90 °C. Additional 500 mL of water was added and followed by a slow addition of 15 mL of H₂O₂ (3%), turning the color of the solution from dark brown to yellow. The mixture was filtered and washed with 1:10 HCl aqueous solution (250 mL) to remove metal ions followed by washing with 200 mL of water to remove the acid. The resulting solid was diluted to make a GO aqueous dispersion. Finally, it was purified by dialysis for two weeks to remove the remaining metal species, and centrifugated at 4000 rpm for 30 min to remove residual graphite.

2. Characterization of GO

Atomic force microscopic (AFM) images were taken out using a Nanoscope III MultiMode SPM (Digital Instruments) with an AS-12 (“E”) scanner operated in tapping mode in conjunction with a V-shaped tapping tip (Applied Nanostructures SPM model: ACTA). The images were taken at a scan rate of 2 Hz. Raman spectra

were obtained on a RM 2000 microscopic confocal Raman spectrometer (Renishaw PLC, England) employing a 514-nm laser beam, and a charge coupled device detector with 4 cm^{-1} resolution.

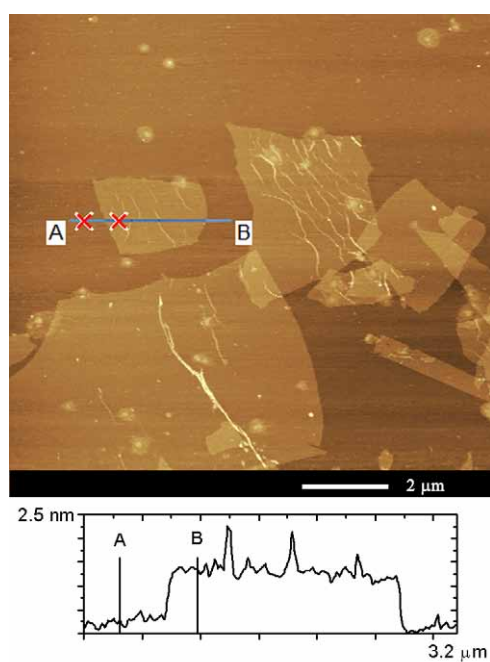


Fig. S1. AFM image of GO sheets. The size of GO used in this work is in the range of several micrometers.

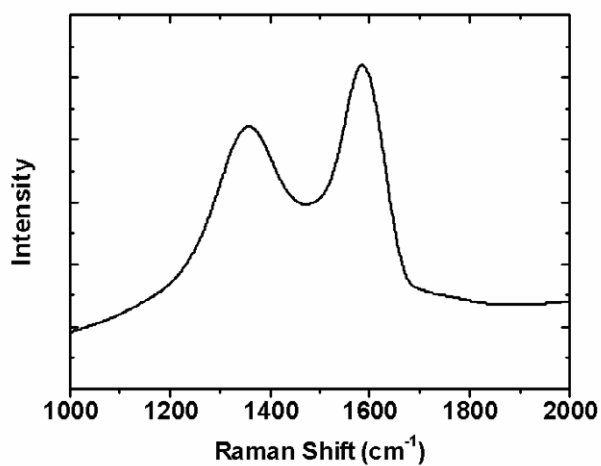


Fig. S2. Raman spectrum of GO sheets.

References

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